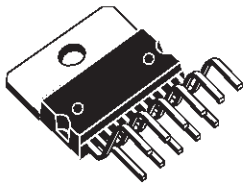
VISIT…

# TDA7265

## 25 +25W STEREO AMPLIFIER WITH MUTE & ST-BY

- WIDE SUPPLY VOLTAGE RANGE (UP TO ±25V ABS MAX.)
- SPLIT SUPPLY
- HIGH OUTPUT POWER
  25 + 25W @ THD =10%, $R_L$ = 8Ω, $V_S$ = ±20V
- NO POP AT TURN-ON/OFF
- MUTE (POP FREE)
- STAND-BY FEATURE (LOW $I_q$)
- SHORT CIRCUIT PROTECTION
- THERMAL OVERLOAD PROTECTION

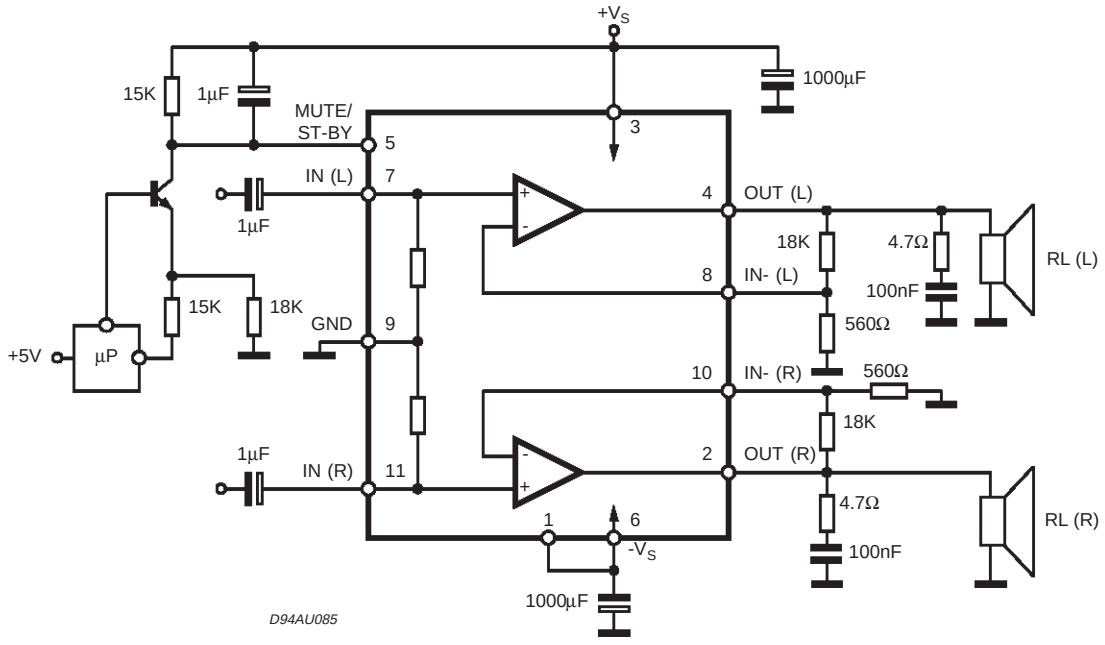


**Multiwatt11**
**ORDERING NUMBER:** TDA7265

### DESCRIPTION

The TDA7265 is class AB dual Audio power amplifier assembled in the Multiwatt package, specially designed for high quality sound application as Hi-Fi music centers and stereo TV sets.

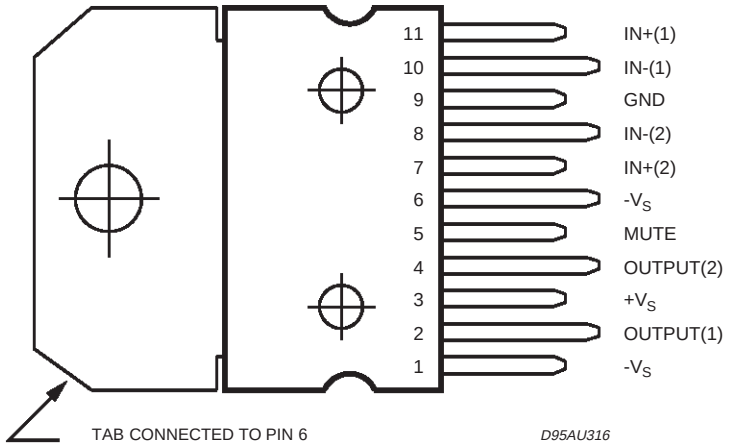
**Figure 1:** Typical Application Circuit



## ABSOLUTE MAXIMUM RATINGS

| Symbol | Parameter | Value | Unit |
|---|---|---|---|
| $V_S$ | DC Supply Voltage | ±25 | V |
| $I_O$ | Output Peak Current (internally limited) | 4.5 | A |
| $P_{tot}$ | Power Dissipation $T_{case}$ = 70°C | 30 | W |
| $T_{op}$ | Operating Temperature | -20 to 85 | °C |
| $T_{stg}$, $T_j$ | Storage and Junction Temperature | -40 to +150 | °C |

## PIN CONNECTION (Top view)




## THERMAL DATA

| Symbol | Description | | Value | Unit |
|---|---|---|---|---|
| $R_{th\ j\text{-}case}$ | Thermal Resistance Junction-case | Max | 2 | °C/W |

**ELECTRICAL CHARACTERISTICS** (Refer to the test circuit, $V_S = \pm 20V$; $R_L = 8\Omega$; $R_S = 50\Omega$; $G_V = 30dB$; f = 1KHz; $T_{amb} = 25°C$, unless otherwise specified.)

| Symbol | Parameter | Test Condition | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| $V_S$ | Supply Range | | ±5 | | ±25 | V |
| $I_q$ | Total Quiescent Current | | | 80 | 130 | mA |
| $V_{OS}$ | Input Offset Voltage | | –20 | | +20 | mV |
| $I_b$ | Non Inverting Input Bias Current | | | 500 | | nA |
| $P_O$ | Music Output Power (*) | THD = 10%; $R_L = 8\Omega$ ; $V_S = \pm 22.5V$ | | 32 | | W |
| $P_O$ | Output Power | THD = 10%<br>$R_L = 8\Omega$ ;<br>$V_S \pm 16V$; $R_L = 4\Omega$ | 20 | 25<br>25 | | W<br>W |
| | | THD = 1%<br>$R_L = 8\Omega$ ;<br>$V_S \pm 16V$; $R_L = 4\Omega$ | | 20<br>20 | | W<br>W |
| THD | Total Harmonic Distortion | $R_L = 8\Omega$ ; $P_O = 1W$; f = 1KHz | | 0.01 | | % |
| | | $R_L = 8\Omega$ ;<br>$P_O = 0.1$ to 15W;<br>f = 100Hz to 15KHz | | | 0.7 | % |
| | | $R_L = 4\Omega$ ; $P_O = 1W$; f = 1KHz | | 0.02 | | % |
| | | $R_L = 4\Omega$ ; $V_S \pm 16V$;<br>$P_O = 0.1$ to 12W;<br>f = 100Hz to 15KHz | | | 1 | % |
| $C_T$ | Cross Talk | f = 1KHz<br>f = 10KHz | | 70<br>60 | | dB<br>dB |
| SR | Slew Rate | | | 10 | | V/µs |
| $G_{OL}$ | Open Loop Voltage Gain | | | 80 | | dB |
| $e_N$ | Total Input Noise | A Curve<br>f = 20Hz to 22KHz | | 3<br>4 | 8 | µV<br>µV |
| $R_i$ | Input Resistance | | 15 | 20 | | KΩ |
| SVR | Supply Voltage Rejection (each channel) | fr = 100Hz Vr = 0.5V | | 60 | | dB |
| $T_j$ | Thermal Shut-down Junction Temperature | | | 145 | | °C |
| **MUTE FUNCTION [ref: +Vs]** | | | | | | |
| $VT_{MUTE}$ | Mute / Play Threshold | | -7 | -6 | -5 | V |
| $A_M$ | Mute Attenuation | | 60 | 70 | | dB |
| **STAND-BY FUNCTION [ref: +Vs]** | | | | | | |
| $VT_{ST-BY}$ | Stand-by / Mute Threshold | | -3.5 | -2.5 | -1.5 | V |
| $A_{ST-BY}$ | Stand-by Attenuation | | | 110 | | dB |
| $I_{q\ ST-BY}$ | Quiescent Current @ Stand-by | | | 3 | | mA |

**Note :**
**(*) FULL POWER up to**. $V_S = \pm 22.5V$ with $R_L = 8\Omega$ and $V_S = \pm 16V$ with $R_L = 4\Omega$
**MUSIC POWER** is the maximal power which the amplifier is capable of producing across the rated load resistance (regardless of non linearity) 1 sec after the application of a sinusoidal input signal of frequency 1K Hz.

**Figure 2:** Quiescent Current vs. Supply Voltage

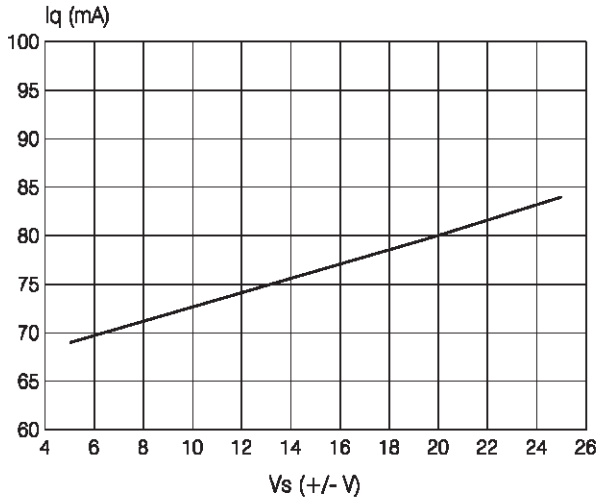



**Figure 3:** Frequency Response

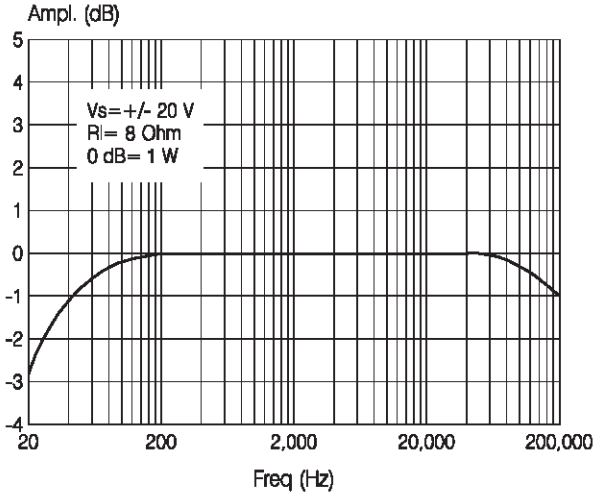



**Figure 4:** Output Power vs. Supply Voltage

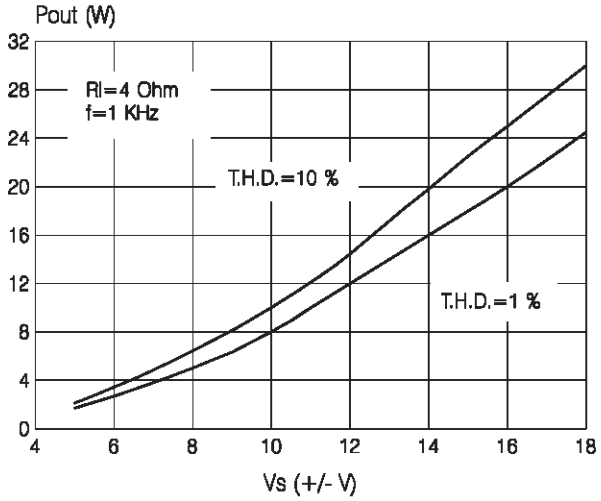



**Figure 5:** T.H.D. vs. Output Power

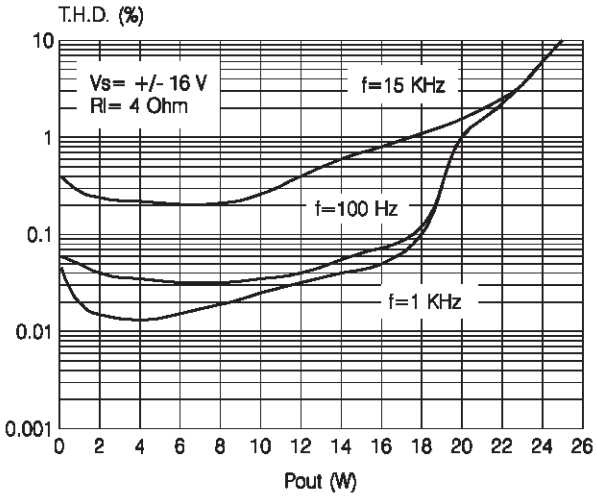



**Figure 6:** Output Power vs. Supply Voltage

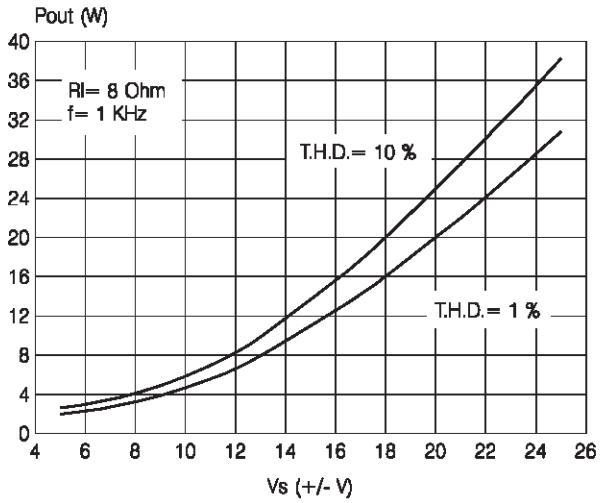



**Figure 7:** T.H.D. vs. Output Power

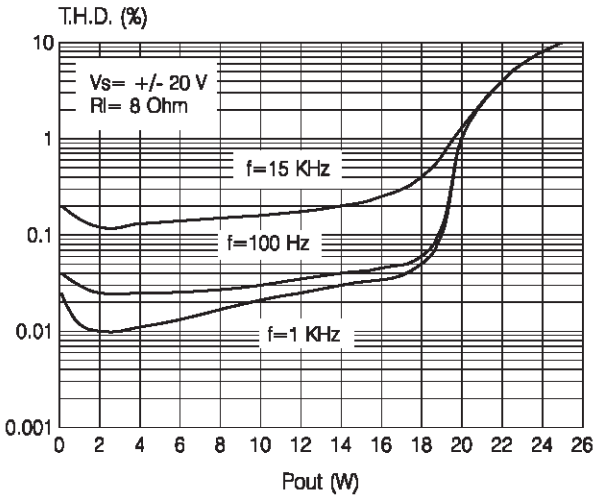


**Figure 8:** Quiescent Current vs. Pin # 5 Voltage

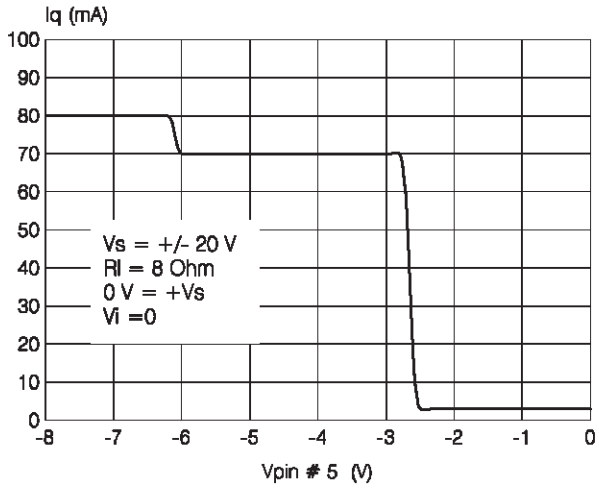



**Figure 9:** Attenuation vs. Pin # 5 Voltage

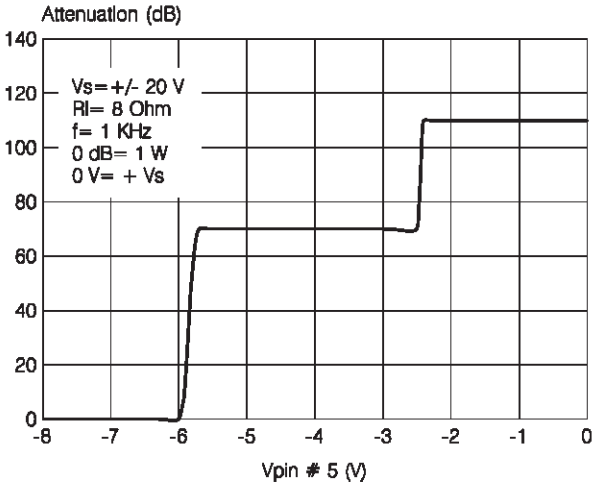



**Figure 10:** SVR vs. Frequency

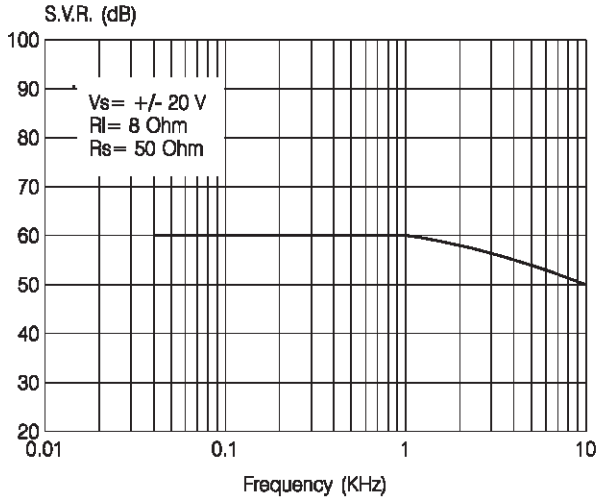



**Figure 11:** Crosstalk vs. Frequency

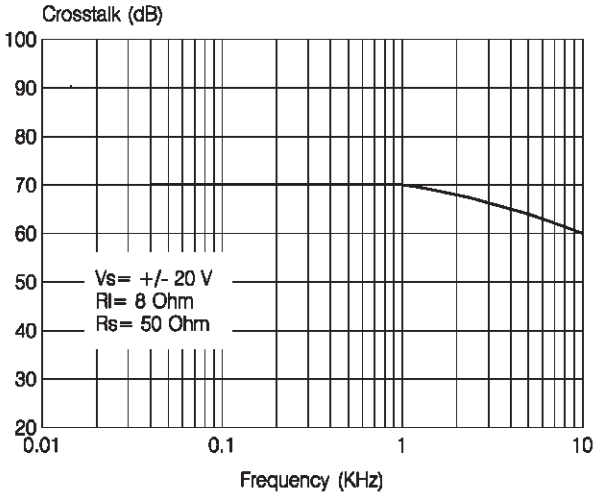



**Figure 12:** Power Dissipaton vs. Output Power

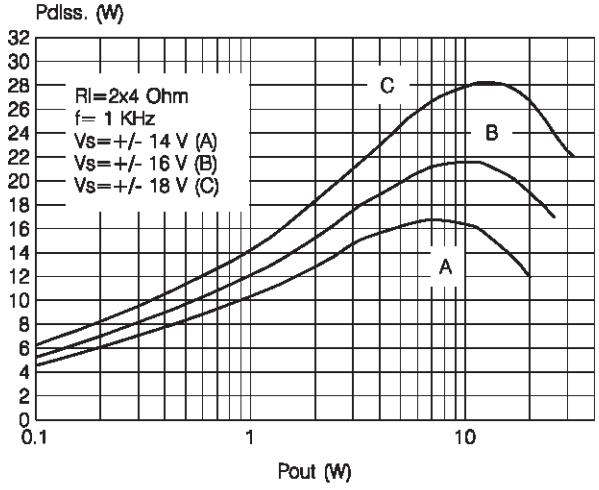
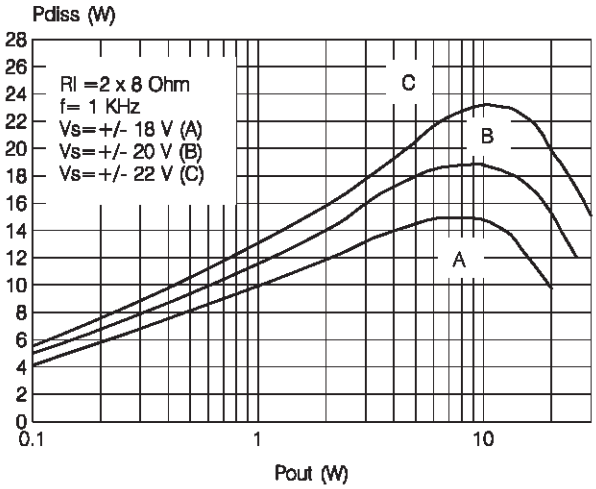



**Figure 13:** Power Dissipaton vs. Output Power



**MUTE STAND-BY FUNCTION**

The pin 5 (MUTE/STAND-BY) controls the amplifier status by two different thresholds, referred to $+V_S$.

- When $V_{pin5}$ higher than = $+V_S$ - 2.5V the amplifier is in Stand-by mode and the final stage generators are off
- when $V_{pin5}$ is between $+V_S$ - 2.5V and $+V_S$ - 6V the final stage current generators are switched on and the amplifier is in mute mode
- when $V_{pin5}$ is lower than $+V_S$ - 6V the amplifier is play mode.

**Figure 14**

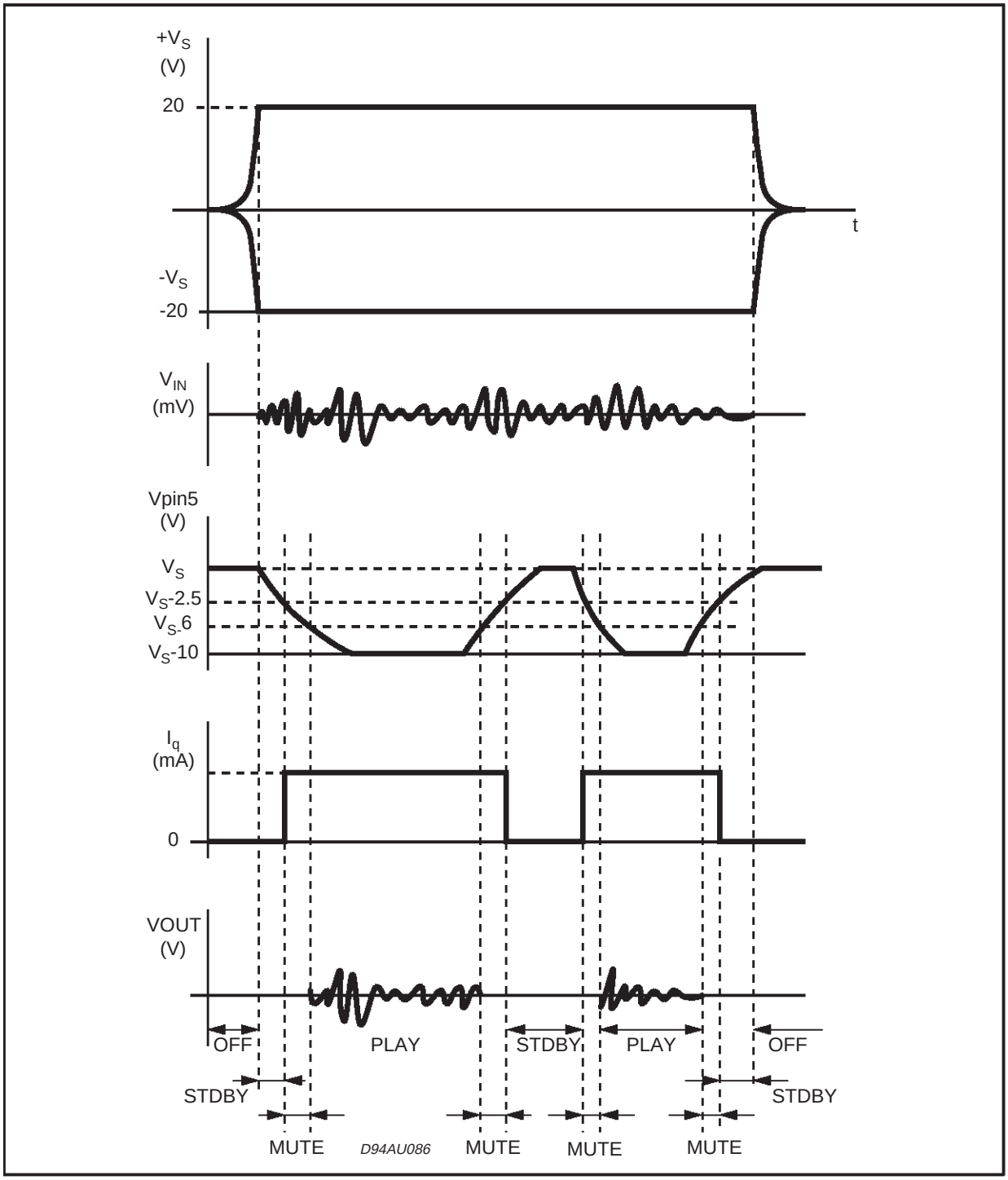


**Figure 15:** Test and Application Circuit (Stereo Configuration)

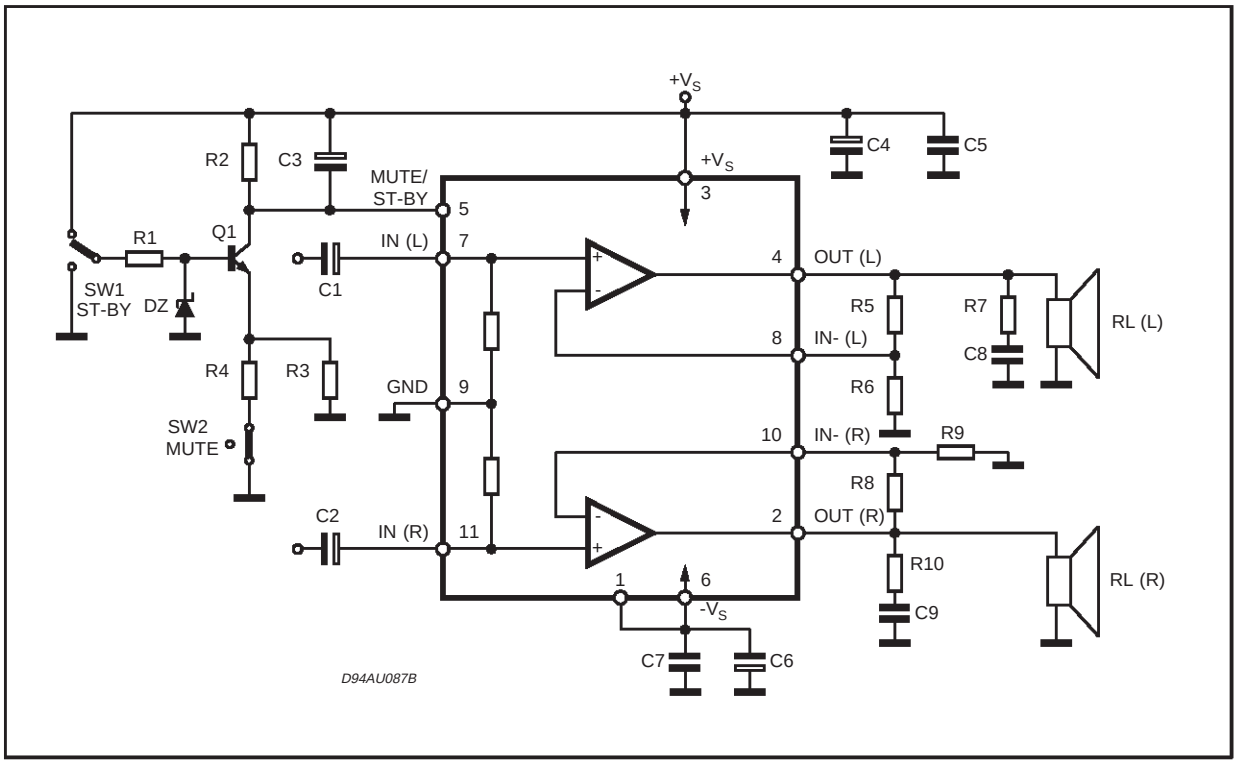
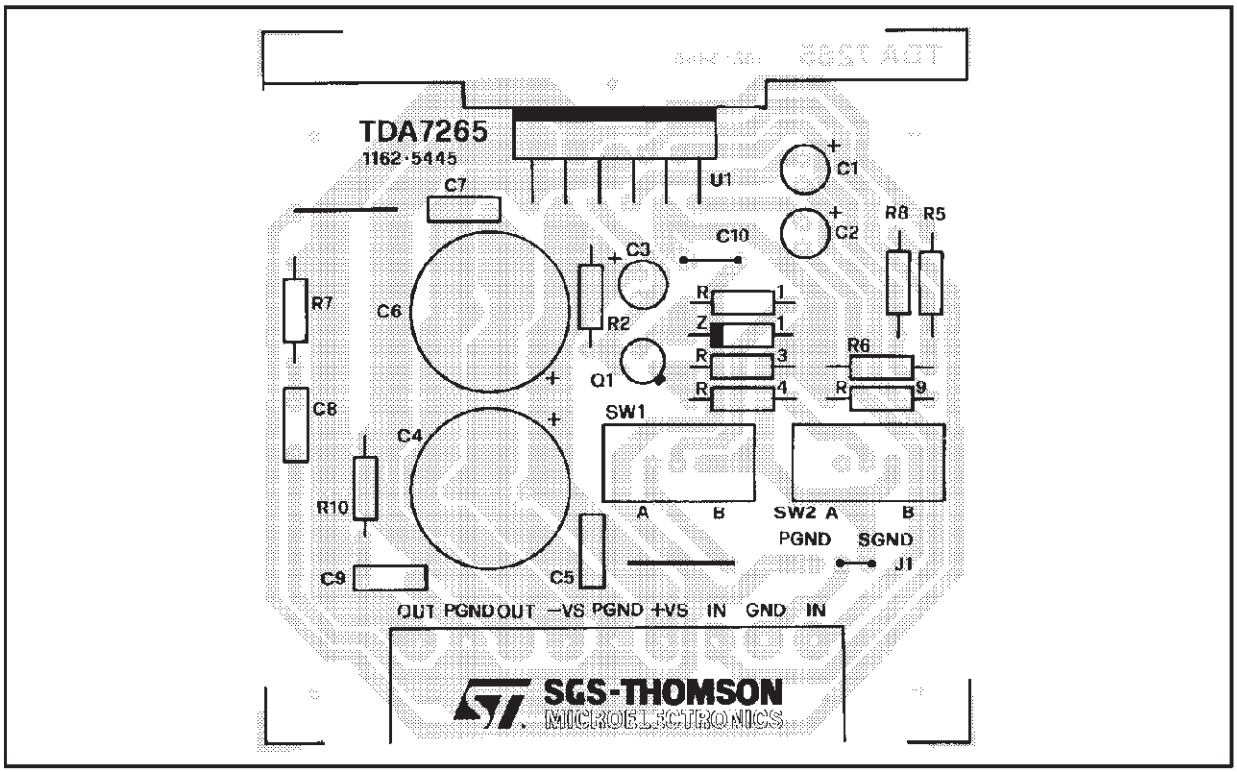



**Figure 16:** PC Board and Components Layout of the figure 15 (1:1 scale)



## APPLICATIONS SUGGESTION

(Demo Board Schematic)

The recommended values of the external components are those shown are the demo board schematic different values can be used: the following table can help the designer.

| COMPONENTS | RECOMMENDED VALUE | PURPOSE | LARGER THAN RECOMMENDED VALUE | SMALLER THAN RECOMMENDED VALUE |
|---|---|---|---|---|
| R1 | 10KΩ | Mute Circuit | Increase of Dz Biasing Current | |
| R2 | 15KΩ | Mute Circuit | $V_{pin}$ # 5 Shifted Downward | $V_{pin}$ # 5 Shifted Upward |
| R3 | 18KΩ | Mute Circuit | $V_{pin}$ # 5 Shifted Upward | $V_{pin}$ # 5 Shifted Downward |
| R4 | 15KΩ | Mute Circuit | $V_{pin}$ # 5 Shifted Upward | $V_{pin}$ # 5 Shifted Downward |
| R5, R8 | 18KΩ | Closed Loop Gain Setting (*) | Increase of Gain | |
| R6, R9 | 560Ω | | Decrease of Gain | |
| R7, R10 | 4.7Ω | Frequency Stability | Danger of Oscillations | Danger of Oscillations |
| C1, C2 | 1µF | Input DC Decoupling | | Higher Low Frequency Cutoff |
| C3 | 1µF | St-By/Mute Time Constant | Larger On/Off Time | Smaller On/Off Time |
| C4, C6 | 1000µF | Supply Voltage Bypass | | Danger of Oscillations |
| C5, C7 | 0.1µF | Supply Voltage Bypass | | Danger of Oscillations |
| C8, C9 | 0.1µF | Frequency Stability | | |
| Dz | 5.1V | Mute Circuit | | |
| Q1 | BC107 | Mute Circuit | | |

(*) Closed loop gain has to be => 25dB

## MUTE, STAND-BY TRUTH TABLE

| SW1 | SW2 | |
|---|---|---|
| B | A | STAND-BY |
| B | B | STAND-BY |
| A | A | MUTE |
| A | B | PLAY |

## BRIDGE APPLICATION

Another application suggestion concerns the BRIDGE configuration, where the two power amplifiers are connected as shown by the schematic diagram of figure. 17.
This application shows, however, some operative limits due to dissipation and current capability of the output stage. For this reason, we reccomend to use the TDA7265 in bridge with the supply voltage equal/lower than ±16V when the load is 8Ω; with higher loads (i.e.16Ω), the amplifier can work correctly in the whole supply voltage range.

The detected characteristics of T.H.D. vs Pout and Frequency Response are shown in fig.18 and fig.19.
With R1=8Ω, Vs=+/-16V the maximum output power obtainable is 50W at T.D.H.=10%.
The quiescent current remains unchanged with respect to the stereo configuration (~80mA as typical at Vs=+/-16V).
The last point to take into consideration concerns the short-circuit protection. As for the stereo application, the TDA7265 is fully protected against any kind of short-circuit ( between Out/Gnd, Out/+Vs and Out/-Vs).

**Figure 17:** Bridge Application Circuit

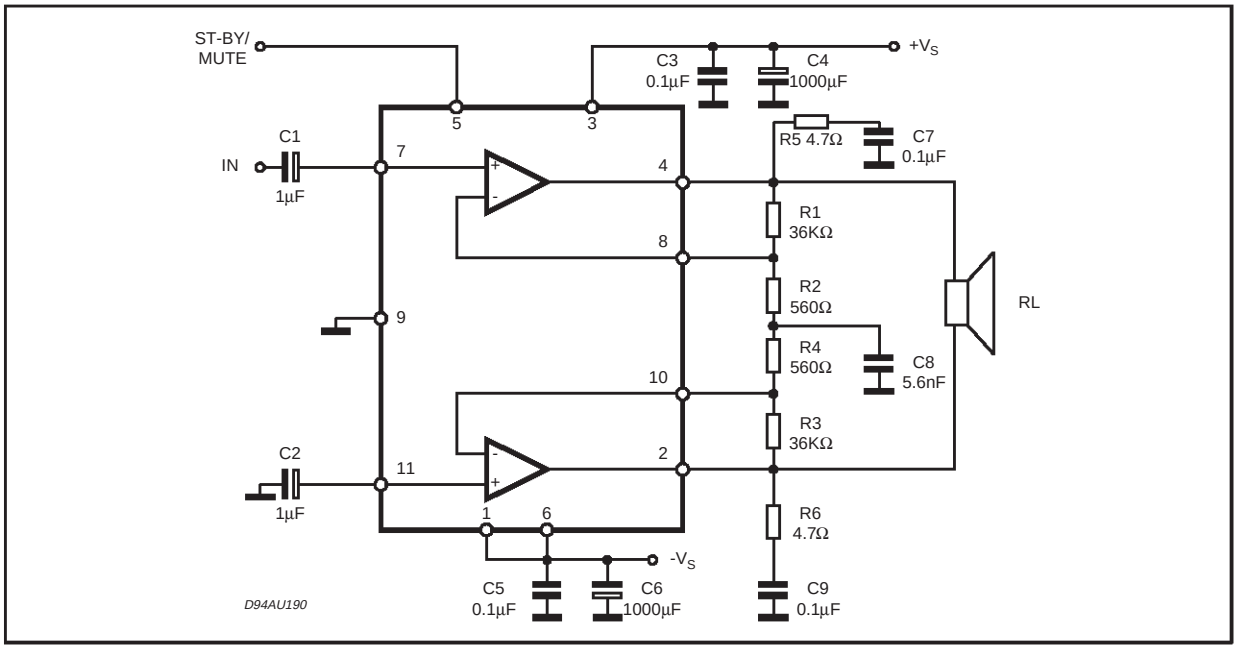



**Figure 18:** Distortion vs. Output Power

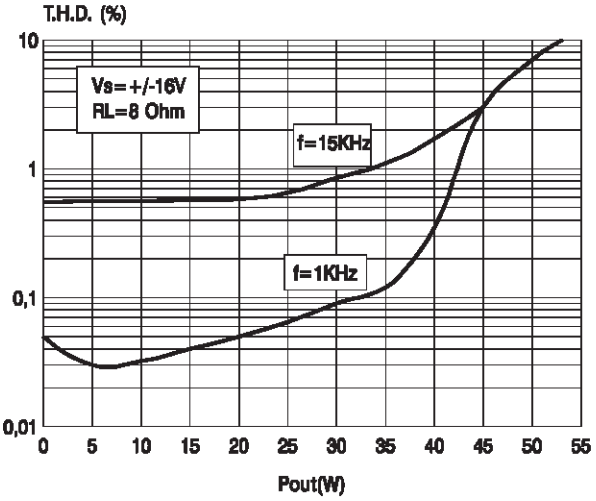
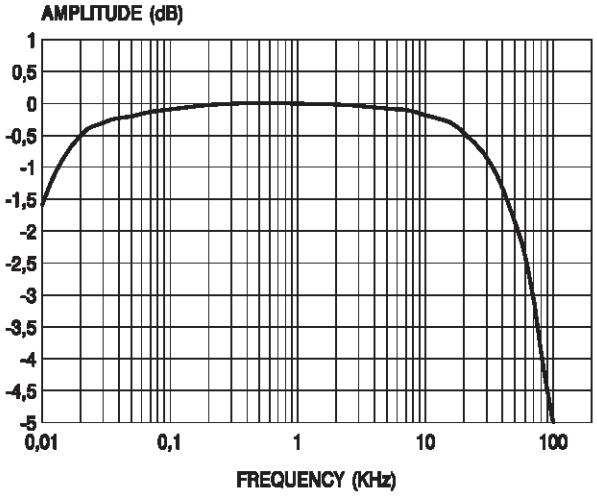
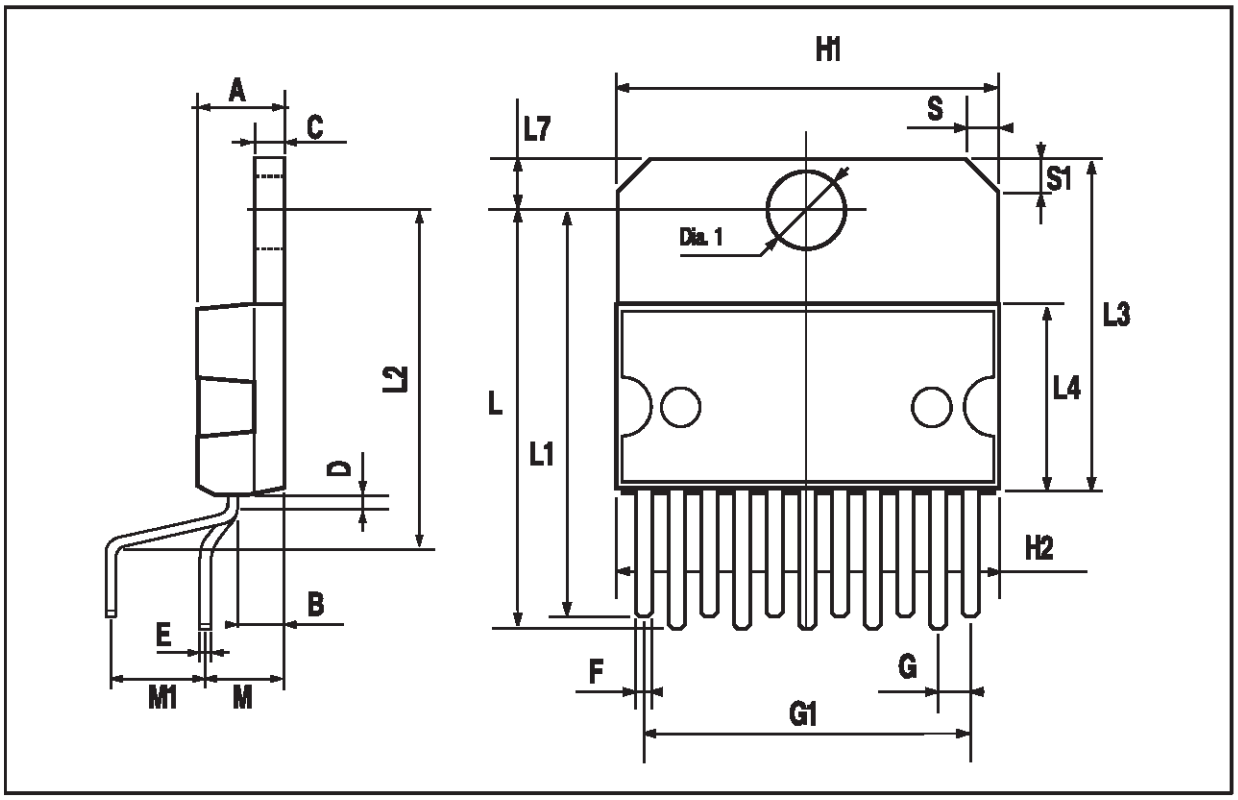



**Figure 19:** Frequency Response of the Bridge Applications



## MULTIWATT11 PACKAGE MECHANICAL DATA

| DIM. | mm | | | inch | | |
|---|---|---|---|---|---|---|
| | MIN. | TYP. | MAX. | MIN. | TYP. | MAX. |
| A | | | 5 | | | 0.197 |
| B | | | 2.65 | | | 0.104 |
| C | | | 1.6 | | | 0.063 |
| D | | 1 | | | 0.039 | |
| E | 0.49 | | 0.55 | 0.019 | | 0.022 |
| F | 0.88 | | 0.95 | 0.035 | | 0.037 |
| G | 1.57 | 1.7 | 1.83 | 0.062 | 0.067 | 0.072 |
| G1 | 16.87 | 17 | 17.13 | 0.664 | 0.669 | 0.674 |
| H1 | 19.6 | | | 0.772 | | |
| H2 | | | 20.2 | | | 0.795 |
| L | 21.5 | | 22.3 | 0.846 | | 0.878 |
| L1 | 21.4 | | 22.2 | 0.843 | | 0.874 |
| L2 | 17.4 | | 18.1 | 0.685 | | 0.713 |
| L3 | 17.25 | 17.5 | 17.75 | 0.679 | 0.689 | 0.699 |
| L4 | 10.3 | 10.7 | 10.9 | 0.406 | 0.421 | 0.429 |
| L7 | 2.65 | | 2.9 | 0.104 | | 0.114 |
| M | 4.1 | 4.3 | 4.5 | 0.161 | 0.169 | 0.177 |
| M1 | 4.88 | 5.08 | 5.3 | 0.192 | 0.200 | 0.209 |
| S | 1.9 | | 2.6 | 0.075 | | 0.102 |
| S1 | 1.9 | | 2.6 | 0.075 | | 0.102 |
| Dia1 | 3.65 | | 3.85 | 0.144 | | 0.152 |



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